Date: Sat, 1 Jan 94 04:30:34 PST
From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>
Errors-To: Ham-Space-Errors@UCSD.Edu
Reply-To: Ham-Space@UCSD.Edu
Precedence: Bulk
Subject: Ham-Space Digest V93 #129
To: Ham-Space

Ham-Space Digest Sat, 1 Jan 94 Volume 93 : Issue 129

Today's Topics:

ORBS$365.2L.AMSAT
ORBS$365.MICRO.AMSAT
ORBS$365.MISC.AMSAT
ORBS$365.OSCAR.AMSAT
ORBS$365.WEATH,AMSAT
Shuttle radio freqs???
TrakBox panel layout gif file

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

Date: Fri, 31 Dec 1993 09:47:00 MST
From: library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!nntp.cs.ubc.ca!alberta!
nebulus!ve6mgs!usenet@network.ucsd.edu
Subject: ORBS$365.2L.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-365.N
2Line Orbital Elements 365.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX December 31, 1993
BID: $ORBS-365.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ

KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B   93360.41320507 -.00000311 00000-0 10000-3 0 2379
2 14129 27.2015 349.6000 6021502 141.2833 282.9354 2.05879668 79220
UO-11
1 14781U 84021B   93362.07707859 .00000213 00000-0 44030-4 0 6439
2 14781 97.7938 19.7461 0012661 94.0796 266.1858 14.69108205525188
RS-10/11
1 18129U 87054A   93362.24286562 .00000047 00000-0 35308-4 0 8413
2 18129 82.9283 95.2053 0012703 133.8292 226.3913 13.72328759326464
AO-13
1 19216U 88051B   93358.73417009 -.00000359 00000-0 10000-4 0 8510
2 19216 57.9609 277.2102 7211124 331.1032   3.3836 2.09723023 42354
FO-20
1 20480U 90013C   93364.10373196 -.00000018 00000-0 32924-4 0 6409
2 20480 99.0174 183.0203 0541189   2.6742 357.7056 12.83223163182445
AO-21
1 21087U 91006A   93363.78995260 .00000094 00000-0 82657-4 0 4017
2 21087 82.9450 268.0636 0034363 194.3521 165.6661 13.74530789146316
RS-12/13
1 21089U 91007A   93362.84080438 .00000036 00000-0 22759-4 0 6439
2 21089 82.9219 137.7780 0028333 221.5044 138.3962 13.74032271145252
ARSENE
1 22654U 93031B   93321.93138545 -.00000051 00000-0 10000-3 0 2108
2 22654   1.4185 113.8817 2935300 161.0091 211.2000 1.42195961 2757
UO-14
1 20437U 90005B   93362.19825192 .00000046 00000-0 34841-4 0 9422
2 20437 98.6028 84.2277 0011292 337.6205 22.4483 14.29812711205154
AO-16
1 20439U 90005D   93362.19044136 .00000021 00000-0 25387-4 0 7432
2 20439 98.6109 85.2804 0011413 338.4753 21.5948 14.29868863205161
DO-17
1 20440U 90005E   93362.72112281 .00000022 00000-0 25520-4 0 7430
2 20440 98.6115 86.0734 0011486 336.0862 23.9786 14.30006589205253
WO-18
1 20441U 90005F   93362.27369208 .00000029 00000-0 28118-4 0 7448
2 20441 98.6107 85.6427 0012153 337.9287 22.1370 14.29983727205191
LO-19
1 20442U 90005G   93362.19321976 .00000022 00000-0 25674-4 0 7425
2 20442 98.6119 85.7807 0012433 337.6335 22.4304 14.30076764205196
UO-22
1 21575U 91050B   93362.39229816 .00000047 00000-0 30411-4 0 4436
2 21575 98.4537 75.2021 0008751 77.8526 282.3610 14.36876541128559
KO-23

```
1 22077U 92052B   93362.88719632 -.00000037  00000-0  10000-3 0  3396
2 22077  66.0871 276.5452 0007562 329.2575  30.7992 12.86282651 64889
AO-27
1 22825U 93061C   93362.71502970  .00000018  00000-0  25222-4 0  2418
2 22825  98.6728  75.1048 0008935 352.3570   7.7472 14.27597768 13362
IO-26
1 22826U 93061D   93362.70832665  .00000012  00000-0  22595-4 0  2420
2 22826  98.6726  75.1103 0009492 353.4556   6.6499 14.27700094 13363
KO-25
1 22830U 93061H   93362.19680552  .00000030  00000-0  29598-4 0  2424
2 22830  98.5723  73.6658 0010898 323.0543  36.9888 14.28024415 13290
NOAA-9
1 15427U 84123A   93354.09639046  .00000113  00000-0  84054-4 0  6423
2 15427  99.0778  37.2630 0015442   8.0271 352.1146 14.13572305465048
NOAA-10
1 16969U 86073A   93354.02187208  .00000062  00000-0  44748-4 0  5408
2 16969  98.5124   3.4782 0013795 128.8764 231.3649 14.24851603377095
MET-2/17
1 18820U 88005A   93362.20414100  .00000056  00000-0  36911-4 0  2410
2 18820  82.5428  44.6042 0015693 305.2443  54.7243 13.84703211298694
MET-3/2
1 19336U 88064A   93362.22551918  .00000051  00000-0  10000-3 0  2425
2 19336  82.5429  84.6681 0016253 335.1957  24.8381 13.16962602260759
NOAA-11
1 19531U 88089A   93354.12874457  .00000106  00000-0  81723-4 0  4407
2 19531  99.1549 333.8243 0011091 278.6226  81.3688 14.12942396269933
MET-2/18
1 19851U 89018A   93362.79483548  .00000079  00000-0  57302-4 0  2429
2 19851  82.5220 279.7621 0014935 351.2669   8.8229 13.84353093244113
MET-3/3
1 20305U 89086A   93362.87463836  .00000044  00000-0  10000-3 0  9564
2 20305  82.5503  27.7388 0007101   1.6384 358.4743 13.04420277200692
MET-2/19
1 20670U 90057A   93362.06042048  .00000023  00000-0  79036-5 0  7424
2 20670  82.5450 344.3934 0014555 269.7083  90.2412 13.84185237176943
FY-1/2
1 20788U 90081A   93360.47055517  .00000417  00000-0  30433-3 0  8513
2 20788  98.8535  21.0647 0016083 128.7875 238.6680 14.01407715169516
MET-2/20
1 20826U 90086A   93362.27946736  .00000083  00000-0  61800-4 0  7413
2 20826  82.5264 281.9547 0012825 160.7503 199.4144 13.83567961164128
MET-3/4
1 21232U 91030A   93361.86310622  .00000050  00000-0  10000-3 0  6483
2 21232  82.5410 290.7099 0011909 255.3812 104.5990 13.16458134128818
NOAA-12
1 21263U 91032A   93354.09713546  .00000151  00000-0  87438-4 0  8471
2 21263  98.6387  20.6638 0013805  38.8062 321.4103 14.22347172135079
MET-3/5
```

```
1 21655U 91056A   93362.17791313  .00000051  00000-0  10000-3 0  6453
2 21655  82.5558 237.5032 0012942 268.1655  91.7985 13.16826722113953
MET-2/21
1 22782U 93055A   93362.91772042  .00000054  00000-0  36147-4 0  2423
2 22782  82.5473 341.3647 0022838 347.0390  13.0185 13.82995463 16554
MIR
1 16609U 86017A   93364.19950354  .00010973  00000-0  14240-3 0   664
2 16609  51.6194 314.7124 0005815 145.1002 215.0377 15.59385717449681
HUBBLE
1 20580U 90037B   93363.20816968  .00000799  00000-0  64998-4 0  4134
2 20580  28.4701 247.6909 0006246 111.9745 248.1500 14.90398236  4001
GRO
1 21225U 91027B   93356.46954065  .00003496  00000-0  79758-4 0   382
2 21225  28.4628  17.8570 0003464  25.0031 335.0734 15.39616634 29662
UARS
1 21701U 91063B   93362.29467793  .00002147  00000-0  20924-3 0  4449
2 21701  56.9814 123.8167 0005590 106.6502 253.5156 14.96341260125352
POSAT
1 22829U 93061G   93362.61920446  .00000038  00000-0  33117-4 0  2349
2 22829  98.6675  75.0256 0010212 340.0264  20.0536 14.27992747 13356
/EX

------------------------------

Date: Fri, 31 Dec 1993 09:39:00 MST
From: usc!cs.utexas.edu!swrinde!gatech!usenet.ins.cwru.edu!agate!library.ucla.edu!
news.mic.ucla.edu!unixg.ubc.ca!nntp.cs.ubc.ca!alberta!nebulus!ve6mgs!
usenet@network.ucsd.edu
Subject: ORBS$365.MICRO.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT  $ORBS-365.D
Orbital Elements  365.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX December 31, 1993
BID: $ORBS-365.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time:      93362.19825192
Element set:     942
Inclination: 98.6028 deg
RA of node:        84.2277 deg
Eccentricity: 0.0011292
Arg of perigee:   337.6205 deg
Mean anomaly:      22.4483 deg
```

```
Mean motion:   14.29812711 rev/day
Decay rate:        4.6e-07 rev/day^2
Epoch rev:           20515
Checksum: 293

Satellite: AO-16
Catalog number: 20439
Epoch time:      93362.19044136
Element set:     743
Inclination: 98.6109 deg
RA of node:        85.2804 deg
Eccentricity: 0.0011413
Arg of perigee:   338.4753 deg
Mean anomaly:      21.5948 deg
Mean motion:   14.29868863 rev/day
Decay rate:        2.1e-07 rev/day^2
Epoch rev:           20516
Checksum: 305

Satellite: DO-17
Catalog number: 20440
Epoch time:      93362.72112281
Element set:     743
Inclination: 98.6115 deg
RA of node:        86.0734 deg
Eccentricity: 0.0011486
Arg of perigee:   336.0862 deg
Mean anomaly:      23.9786 deg
Mean motion:   14.30006589 rev/day
Decay rate:        2.2e-07 rev/day^2
Epoch rev:           20525
Checksum: 285

Satellite: WO-18
Catalog number: 20441
Epoch time:      93362.27369208
Element set:     744
Inclination: 98.6107 deg
RA of node:        85.6427 deg
Eccentricity: 0.0012153
Arg of perigee:   337.9287 deg
Mean anomaly:      22.1370 deg
Mean motion:   14.29983727 rev/day
Decay rate:        2.9e-07 rev/day^2
Epoch rev:           20519
Checksum: 315

Satellite: LO-19
```

Catalog number: 20442
Epoch time: 93362.19321976
Element set: 742
Inclination: 98.6119 deg
RA of node: 85.7807 deg
Eccentricity: 0.0012433
Arg of perigee: 337.6335 deg
Mean anomaly: 22.4304 deg
Mean motion: 14.30076764 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 20519
Checksum: 293

Satellite: UO-22
Catalog number: 21575
Epoch time: 93362.39229816
Element set: 443
Inclination: 98.4537 deg
RA of node: 75.2021 deg
Eccentricity: 0.0008751
Arg of perigee: 77.8526 deg
Mean anomaly: 282.3610 deg
Mean motion: 14.36876541 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 12855
Checksum: 317

Satellite: KO-23
Catalog number: 22077
Epoch time: 93362.88719632
Element set: 339
Inclination: 66.0871 deg
RA of node: 276.5452 deg
Eccentricity: 0.0007562
Arg of perigee: 329.2575 deg
Mean anomaly: 30.7992 deg
Mean motion: 12.86282651 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 6488
Checksum: 336

Satellite: AO-27
Catalog number: 22825
Epoch time: 93362.71502970
Element set: 241
Inclination: 98.6728 deg
RA of node: 75.1048 deg
Eccentricity: 0.0008935

```
Arg of perigee:   352.3570 deg
Mean anomaly:       7.7472 deg
Mean motion:   14.27597768 rev/day
Decay rate:        1.8e-07 rev/day^2
Epoch rev:            1336
Checksum: 320

Satellite: IO-26
Catalog number: 22826
Epoch time:      93362.70832665
Element set:     242
Inclination: 98.6726 deg
RA of node:        75.1103 deg
Eccentricity: 0.0009492
Arg of perigee:   353.4556 deg
Mean anomaly:       6.6499 deg
Mean motion:   14.27700094 rev/day
Decay rate:        1.2e-07 rev/day^2
Epoch rev:            1336
Checksum: 301

Satellite: KO-25
Catalog number: 22830
Epoch time:      93362.19680552
Element set:     242
Inclination: 98.5723 deg
RA of node:        73.6658 deg
Eccentricity: 0.0010898
Arg of perigee:   323.0543 deg
Mean anomaly:      36.9888 deg
Mean motion:   14.28024415 rev/day
Decay rate:        3.0e-07 rev/day^2
Epoch rev:            1329
Checksum: 306

/EX

------------------------------

Date: Fri, 31 Dec 1993 09:44:00 MST
From: swrinde!cs.utexas.edu!howland.reston.ans.net!math.ohio-state.edu!
cyber2.cyberstore.ca!nntp.cs.ubc.ca!alberta!nebulus!ve6mgs!usenet@network.ucsd.edu
Subject: ORBS$365.MISC.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT  $ORBS-365.M
Orbital Elements  365.MISC
```

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX December 31, 1993
BID: $ORBS-365.M
TO ALL RADIO AMATEURS BT

Satellite: MIR
Catalog number: 16609
Epoch time: 93364.19950354
Element set: 66
Inclination: 51.6194 deg
RA of node: 314.7124 deg
Eccentricity: 0.0005815
Arg of perigee: 145.1002 deg
Mean anomaly: 215.0377 deg
Mean motion: 15.59385717 rev/day
Decay rate: 1.0973e-04 rev/day^2
Epoch rev: 44968
Checksum: 309

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 93363.20816968
Element set: 413
Inclination: 28.4701 deg
RA of node: 247.6909 deg
Eccentricity: 0.0006246
Arg of perigee: 111.9745 deg
Mean anomaly: 248.1500 deg
Mean motion: 14.90398236 rev/day
Decay rate: 7.99e-06 rev/day^2
Epoch rev: 400
Checksum: 295

Satellite: GRO
Catalog number: 21225
Epoch time: 93356.46954065
Element set: 38
Inclination: 28.4628 deg
RA of node: 17.8570 deg
Eccentricity: 0.0003464
Arg of perigee: 25.0031 deg
Mean anomaly: 335.0734 deg
Mean motion: 15.39616634 rev/day
Decay rate: 3.496e-05 rev/day^2
Epoch rev: 2966
Checksum: 296

Satellite: UARS

Catalog number: 21701
Epoch time: 93362.29467793
Element set: 444
Inclination: 56.9814 deg
RA of node: 123.8167 deg
Eccentricity: 0.0005590
Arg of perigee: 106.6502 deg
Mean anomaly: 253.5156 deg
Mean motion: 14.96341260 rev/day
Decay rate: 2.147e-05 rev/day^2
Epoch rev: 12535
Checksum: 294

Satellite: POSAT
Catalog number: 22829
Epoch time: 93362.61920446
Element set: 234
Inclination: 98.6675 deg
RA of node: 75.0256 deg
Eccentricity: 0.0010212
Arg of perigee: 340.0264 deg
Mean anomaly: 20.0536 deg
Mean motion: 14.27992747 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 1335
Checksum: 279

/EX

Date: Fri, 31 Dec 1993 09:36:00 MST
From: galaxy.ucr.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!
nntp.cs.ubc.ca!alberta!nebulus!ve6mgs!usenet@network.ucsd.edu
Subject: ORBS$365.OSCAR.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-365.O
Orbital Elements 365.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX December 31, 1993
BID: $ORBS-365.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 93360.41320507

```
Element set:     237
Inclination: 27.2015 deg
RA of node:       349.6000 deg
Eccentricity: 0.6021502
Arg of perigee:   141.2833 deg
Mean anomaly:     282.9354 deg
Mean motion:    2.05879668 rev/day
Decay rate:      -3.11e-06 rev/day^2
Epoch rev:            7922
Checksum: 270

Satellite: UO-11
Catalog number: 14781
Epoch time:      93362.07707859
Element set:     643
Inclination: 97.7938 deg
RA of node:        19.7461 deg
Eccentricity: 0.0012661
Arg of perigee:    94.0796 deg
Mean anomaly:     266.1858 deg
Mean motion:   14.69108205 rev/day
Decay rate:       2.13e-06 rev/day^2
Epoch rev:           52518
Checksum: 333

Satellite: RS-10/11
Catalog number: 18129
Epoch time:      93362.24286562
Element set:     841
Inclination: 82.9283 deg
RA of node:        95.2053 deg
Eccentricity: 0.0012703
Arg of perigee:   133.8292 deg
Mean anomaly:     226.3913 deg
Mean motion:   13.72328759 rev/day
Decay rate:        4.7e-07 rev/day^2
Epoch rev:           32646
Checksum: 308

Satellite: AO-13
Catalog number: 19216
Epoch time:      93358.73417009
Element set:     851
Inclination: 57.9609 deg
RA of node:       277.2102 deg
Eccentricity: 0.7211124
Arg of perigee:   331.1032 deg
Mean anomaly:       3.3836 deg
```

```
Mean motion:    2.09723023 rev/day
Decay rate:      -3.59e-06 rev/day^2
Epoch rev:            4235
Checksum: 277

Satellite: FO-20
Catalog number: 20480
Epoch time:      93364.10373196
Element set:     640
Inclination: 99.0174 deg
RA of node:       183.0203 deg
Eccentricity: 0.0541189
Arg of perigee:     2.6742 deg
Mean anomaly:     357.7056 deg
Mean motion:   12.83223163 rev/day
Decay rate:       -1.8e-07 rev/day^2
Epoch rev:           18244
Checksum: 281

Satellite: AO-21
Catalog number: 21087
Epoch time:      93363.78995260
Element set:     401
Inclination: 82.9450 deg
RA of node:       268.0636 deg
Eccentricity: 0.0034363
Arg of perigee:   194.3521 deg
Mean anomaly:     165.6661 deg
Mean motion:   13.74530789 rev/day
Decay rate:        9.4e-07 rev/day^2
Epoch rev:           14631
Checksum: 316

Satellite: RS-12/13
Catalog number: 21089
Epoch time:      93362.84080438
Element set:     643
Inclination: 82.9219 deg
RA of node:       137.7780 deg
Eccentricity: 0.0028333
Arg of perigee:   221.5044 deg
Mean anomaly:     138.3962 deg
Mean motion:   13.74032271 rev/day
Decay rate:        3.6e-07 rev/day^2
Epoch rev:           14525
Checksum: 298

Satellite: ARSENE
```

Catalog number: 22654
Epoch time: 93321.93138545
Element set: 210
Inclination: 1.4185 deg
RA of node: 113.8817 deg
Eccentricity: 0.2935300
Arg of perigee: 161.0091 deg
Mean anomaly: 211.2000 deg
Mean motion: 1.42195961 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 275
Checksum: 241

/EX

Date: Fri, 31 Dec 1993 09:42:00 MST
From: library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!nntp.cs.ubc.ca!alberta!
nebulus!ve6mgs!usenet@network.ucsd.edu
Subject: ORBS$365.WEATH,AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-365.W
Orbital Elements 365.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX December 31, 1993
BID: $ORBS-365.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 93354.09639046
Element set: 642
Inclination: 99.0778 deg
RA of node: 37.2630 deg
Eccentricity: 0.0015442
Arg of perigee: 8.0271 deg
Mean anomaly: 352.1146 deg
Mean motion: 14.13572305 rev/day
Decay rate: 1.13e-06 rev/day^2
Epoch rev: 46504
Checksum: 283

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 93354.02187208

```
Element set:     540
Inclination: 98.5124 deg
RA of node:         3.4782 deg
Eccentricity: 0.0013795
Arg of perigee:   128.8764 deg
Mean anomaly:     231.3649 deg
Mean motion:   14.24851603 rev/day
Decay rate:        6.2e-07 rev/day^2
Epoch rev:           37709
Checksum: 314

Satellite: MET-2/17
Catalog number: 18820
Epoch time:      93362.20414100
Element set:     241
Inclination: 82.5428 deg
RA of node:        44.6042 deg
Eccentricity: 0.0015693
Arg of perigee:   305.2443 deg
Mean anomaly:      54.7243 deg
Mean motion:   13.84703211 rev/day
Decay rate:        5.6e-07 rev/day^2
Epoch rev:           29869
Checksum: 276

Satellite: MET-3/2
Catalog number: 19336
Epoch time:      93362.22551918
Element set:     242
Inclination: 82.5429 deg
RA of node:        84.6681 deg
Eccentricity: 0.0016253
Arg of perigee:   335.1957 deg
Mean anomaly:      24.8381 deg
Mean motion:   13.16962602 rev/day
Decay rate:        5.1e-07 rev/day^2
Epoch rev:           26075
Checksum: 303

Satellite: NOAA-11
Catalog number: 19531
Epoch time:      93354.12874457
Element set:     440
Inclination: 99.1549 deg
RA of node:       333.8243 deg
Eccentricity: 0.0011091
Arg of perigee:   278.6226 deg
Mean anomaly:      81.3688 deg
```

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Mean motion:   14.12942396 rev/day
Decay rate:       1.06e-06 rev/day^2
Epoch rev:           26993
Checksum: 320

Satellite: MET-2/18
Catalog number: 19851
Epoch time:      93362.79483548
Element set:     242
Inclination: 82.5220 deg
RA of node:       279.7621 deg
Eccentricity: 0.0014935
Arg of perigee:   351.2669 deg
Mean anomaly:       8.8229 deg
Mean motion:   13.84353093 rev/day
Decay rate:        7.9e-07 rev/day^2
Epoch rev:           24411
Checksum: 328

Satellite: MET-3/3
Catalog number: 20305
Epoch time:      93362.87463836
Element set:     956
Inclination: 82.5503 deg
RA of node:        27.7388 deg
Eccentricity: 0.0007101
Arg of perigee:     1.6384 deg
Mean anomaly:     358.4743 deg
Mean motion:   13.04420277 rev/day
Decay rate:        4.4e-07 rev/day^2
Epoch rev:           20069
Checksum: 293

Satellite: MET-2/19
Catalog number: 20670
Epoch time:      93362.06042048
Element set:     742
Inclination: 82.5450 deg
RA of node:       344.3934 deg
Eccentricity: 0.0014555
Arg of perigee:   269.7083 deg
Mean anomaly:      90.2412 deg
Mean motion:   13.84185237 rev/day
Decay rate:        2.3e-07 rev/day^2
Epoch rev:           17694
Checksum: 299

Satellite: FY-1/2
```

Catalog number: 20788
Epoch time: 93360.47055517
Element set: 851
Inclination: 98.8535 deg
RA of node: 21.0647 deg
Eccentricity: 0.0016083
Arg of perigee: 128.7875 deg
Mean anomaly: 238.6680 deg
Mean motion: 14.01407715 rev/day
Decay rate: 4.17e-06 rev/day^2
Epoch rev: 16951
Checksum: 318

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 93362.27946736
Element set: 741
Inclination: 82.5264 deg
RA of node: 281.9547 deg
Eccentricity: 0.0012825
Arg of perigee: 160.7503 deg
Mean anomaly: 199.4144 deg
Mean motion: 13.83567961 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 16412
Checksum: 321

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 93361.86310622
Element set: 648
Inclination: 82.5410 deg
RA of node: 290.7099 deg
Eccentricity: 0.0011909
Arg of perigee: 255.3812 deg
Mean anomaly: 104.5990 deg
Mean motion: 13.16458134 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 12881
Checksum: 287

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 93354.09713546
Element set: 847
Inclination: 98.6387 deg
RA of node: 20.6638 deg
Eccentricity: 0.0013805

Arg of perigee: 38.8062 deg
Mean anomaly: 321.4103 deg
Mean motion: 14.22347172 rev/day
Decay rate: 1.51e-06 rev/day^2
Epoch rev: 13507
Checksum: 285

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 93362.17791313
Element set: 645
Inclination: 82.5558 deg
RA of node: 237.5032 deg
Eccentricity: 0.0012942
Arg of perigee: 268.1655 deg
Mean anomaly: 91.7985 deg
Mean motion: 13.16826722 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 11395
Checksum: 316

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 93362.91772042
Element set: 242
Inclination: 82.5473 deg
RA of node: 341.3647 deg
Eccentricity: 0.0022838
Arg of perigee: 347.0390 deg
Mean anomaly: 13.0185 deg
Mean motion: 13.82995463 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 1655
Checksum: 300

/EX

Date: 31 Dec 93 23:52:59 GMT
From: psinntp!can02!news01!pge.com!JWT2@uunet.uu.net
Subject: Shuttle radio freqs???
To: ham-space@ucsd.edu

I help teach math & science to 4th-6th grades at my daughter's school
every couple of weeks. I use the excellent satellite tracking program
STS Plus to display a map of the world that shows where various satellites
are. Using this to know when I would be in range of the shuttle, I want

to monitor appropriate VHF & HF freqs to let the kids hear the shuttle
as it passes. At least this is my plan. I am constantly looking for
ANY trick I can to get the kids interested in math and science.

So... How can I find out what freqs are used during a shuttle mission?

****
   Jim Trudeau - Major Account Rep   "I speak for me, not PG&E..."
   Pacific Gas & Electric Co.   Internet .... jwt2@pge.com
   Marketing Department   America Online ... JimTrudeau
   P.O. Box 671   Phone 916/634-6413
   Marysville, CA, USA 95901   Fax 916/634-6408
****

Date: Sat, 1 Jan 1994 01:23:26 GMT
From: netcomsv!netcom.com!fmitch@decwrl.dec.com
Subject: TrakBox panel layout gif file
To: ham-space@ucsd.edu

hi, mitch, wa4osr here in mobile, al...

i am building the tapr/jamsat trakbox from the tapr kit... i have
laid out a front panel for it with the help of raymond, w4ujz...
the layout, front and back, was done using corel draw... i have
the files available if anyone wants to look at them... and i also
made a gif of the layout that i can ftp to anyone wanting to look
at it... the layout is really spiffy, with the tapr and the jamsat
logos, and a place for your callsign... raymond has developed a
technique for transfering the image to a panel, which we will
be publicizing soon...

for a copy of the files email me...

mitch, wa4osr

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fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR in Mobile, Alabama USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..

Date: Fri, 31 Dec 93 22:07:44 GMT
From: mnemosyne.cs.du.edu!nyx10!bwatson@uunet.uu.net
To: ham-space@ucsd.edu

References <1993Dec28.010251.8520@nosc.mil>, <fmitchCIqBGo.CD5@netcom.com>,
<N4HY.93Dec30130744@wahoo.ccr-p.ida.org>
Subject : Re: Post your Sat-Track software pick here

My favorite is Quicksat written by Mike McCants. It gives you
a choice of parameters for visual or radio observation.

End of Ham-Space Digest V93 #129
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